CIAMFlyer
Introduction to
the Model Aircraft World
FAI AEROMODELLING COMMISSION
6-2020

GYÖRGY BENEDEK – PIONEER OF AIRFOILS FOR LOW REYNOLDS NUMBERS

Martin Dilly

Once model aircraft design had progressed beyond single-surface wings covered with oiled silk in the mid-1920s, almost all model wings used airfoils developed for manned aircraft, which operated at much higher Reynolds numbers than any model. Sections like RAF 32, NACA 6409 and Clark Y were typical, often 12 or 14% thick.

He read F. W. Schmitz's Aerodynamik des Flugmodells

The person who did the most then to produce airfoils suited to flight at low Reynolds numbers was the Hungarian György Benedek, who was born 100 years ago on July 18, 1921. In 1942 Benedek read F.W Schmitz's Aerodynamik des Flugmodells, which clarified that aerodynamics at model sizes differs considerably from that at higher airspeeds and larger chords. Schmitz pointed out for the first time the influence of the low Re number. György decided to tackle the problem; he was studying aeronautical engineering at Budapest Technical University and graduated in 1943. Meanwhile he used the low-speed wind tunnel there to do the initial tests that led to the series of airfoils that bears his name, concentrating on Re numbers between 15-60,000. He used two mathematically-constructed parabolas as a third or fourth order form to produce a basic camber line, adding to it a symmetrical fairing with its greatest thickness at one third chord. Professor Schmitz had suggested a leading edge radius of 0.4% for a 3% thickness and 0.7% for a 60% fairing, but Benedek's later airfoils used a sharper leading edge to produce turbulence. The best results came from sections with maximum camber between 35 and 40% and by February 1944 he finally had a series of 29 airfoils. For those interested there is a lot more information about the design of the Benedek airfoils in the 1981 NFFS Symposium Report, in which he receives the NFFS Special Award for contributions to free flight.

Glider altitude record of 2364 m

For Benedek, despite the War, the early 1940s were a time for record-setting; as well as duration, both outdoor and indoor, there were distance, speed and altitude classes. In 1948 he set a glider altitude record of 2364 meters (7759 feet) using an optical rangefinder, an FAI record which still stands today. He

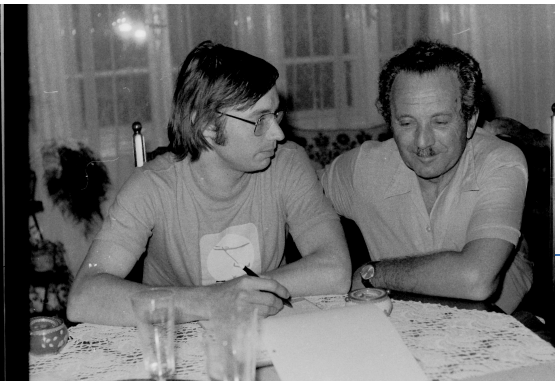
also flew control-line and set a world jet speed record of 281 km/hr using an engine he built himself.

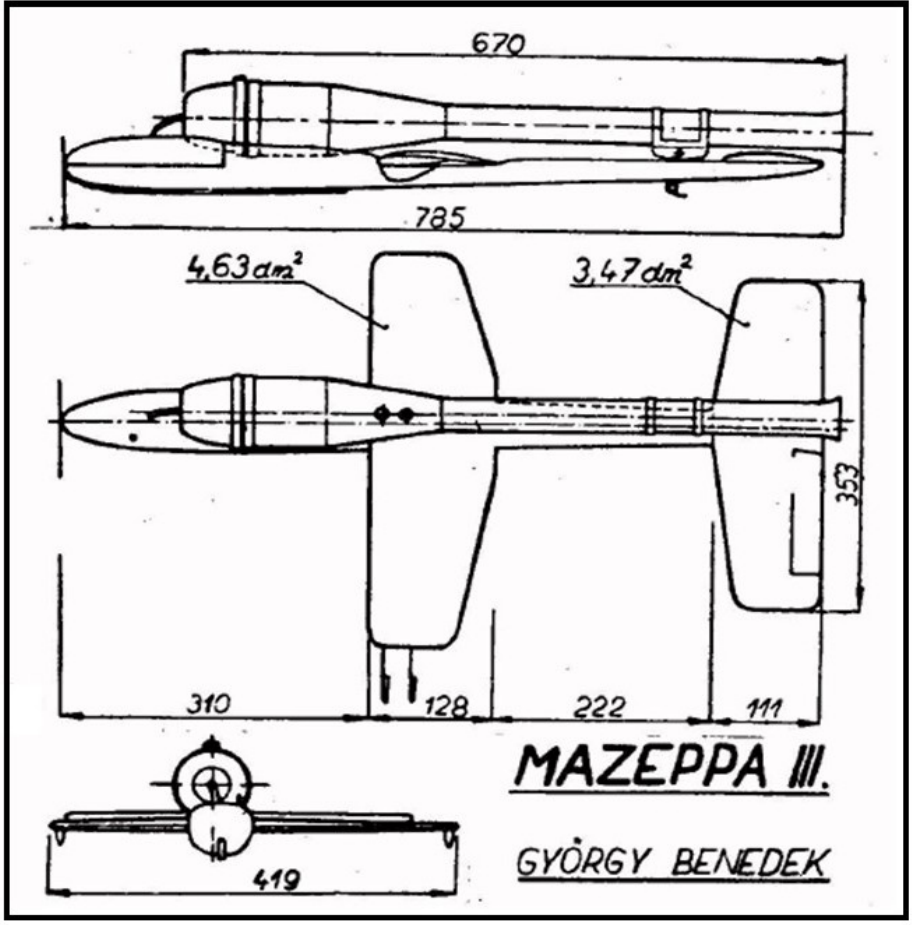
Collaboration with Fred Militky

In the summer of 1944 by chance he met Fred Militky, then a German soldier in Budapest. They kept in touch and in 1948 Benedek helped him to escape from Czechoslovakia to the West, where he worked with Graupner and produced the first electric-powered free-flight model, Silentius, as well as collaborating in the first manned electric aircraft to fly.

György was in charge of the Moki institute in the 1950s and was responsible for the design of the highly successful Moki S-1 glow-plug engine, used in control-line speed models and giving Hungary the team prize at the 1958 World Championships and numerous other international successes.

In 1960 the World Control-Line Championships were held at Budaörs airfield in Hungary with 19 nations competing and György as organiser and chief judge. . US flyer Bill Wisniewski (later to introduce the tuned pipe at the '66 Champs at Swinderby) damaged an engine on a test flight and Benedek allowed him to do some repairs in the Moki workshop. After the event was over, the chief sports director, a Field Marshal in the Army Ministry, charged him with being a "friend of imperialism" because he helped the American flyer more than the participants in the people's democracies. He was charged

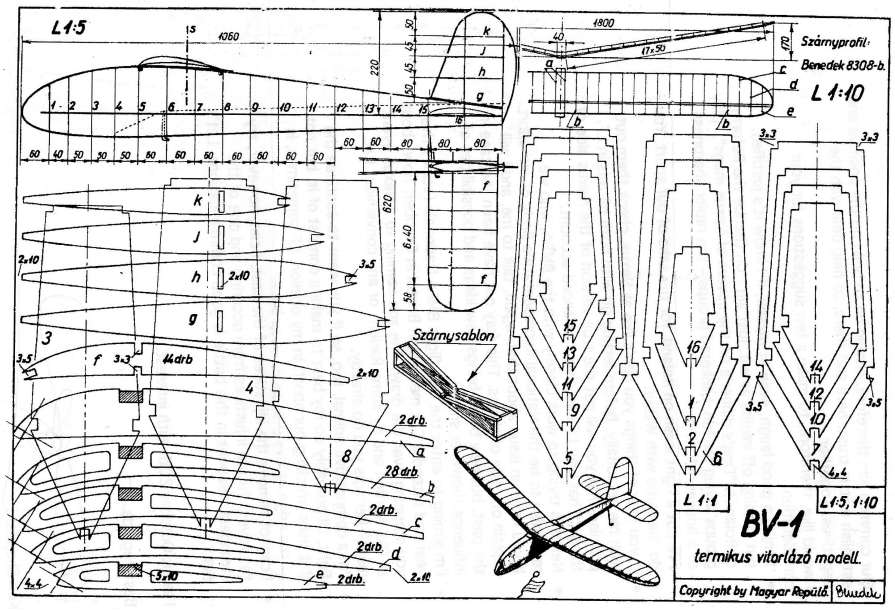




with "adverse behavior against socialist sports morale " and finally excluded from model flying. Despite being banned for political reasons from model flying in Hungary for over 20 years until 1990, György Benedek was awarded the CIAM Antonov Diploma in 1982, recognising the technical innovations he made to benefit our sport.

Mazeppa ***He also flew control-line jet speed and set an FAI record of 281 km/hr with an engine he built himself.***

BV-1, one of Benedek's most successful early gliders



György discusses airfoils in 1981 with future World F1A champion, Mike Fantham.

CIAM Flyer 6-2020
Author of this issue Martin Dilly
Editor: Emil Ch. Giezendanner
ebi.giezendanner@bluewin.ch
http://www.fai.org